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**UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK**

In re

TRONOX INCORPORATED, et al.,

Debtors.

**TRONOX INCORPORATED, TRONOX
WORLDWIDE LLC f/k/a Kerr-McGee Chemical
Worldwide LLC, and TRONOX LLC f/k/a Kerr-
McGee Chemical LLC,**

Plaintiffs,

v.

**ANADARKO PETROLEUM CORPORATION and
KERR-MCGEE CORPORATION, KERR-MCGEE
OIL & GAS CORPORATION, KERR-MCGEE
WORLDWIDE CORPORATION, KERR-MCGEE
INVESTMENT CORPORATION, KERR-MCGEE
CREDIT LLC, KERR-MCGEE SHARED SERVICES
COMPANY LLC, AND KERR-MCGEE STORED
POWER COMPANY LLC**

Defendants.

THE UNITED STATES OF AMERICA,

Plaintiff-Intervenor,

v.

**TRONOX, INC., TRONOX WORLDWIDE LLC,
TRONOX LLC, KERR-MCGEE CORPORATION and
ANADARKO PETROLEUM CORPORATION,**

Defendants.

) Chapter 11

) Case No. 09-10156 (ALG)

) Jointly Administered

) Adv. Pro. No. 09-01198 (ALG)

) **DEFENDANTS' MEMORANDUM OF**
) **LAW IN SUPPORT OF THEIR**
) **MOTION TO EXCLUDE THE**
) **TESTIMONY OF DR. NEIL M. RAM**
) **UNDER FEDERAL RULE OF**
) **EVIDENCE 702**

Defendants Anadarko Petroleum Corporation, Kerr-McGee Corporation, Kerr-McGee Oil & Gas Corporation, Kerr-McGee Worldwide Corporation, Kerr-McGee Investment Corporation, Kerr-McGee Credit LLC, Kerr-McGee Shared Services Company LLC and Kerr-McGee Stored Power Company LLC (“Defendants”) respectfully submit Defendants’ Memorandum Of Law In Support Of Their Motion To Exclude The Testimony Of Dr. Neil M. Ram Under Federal Rule Of Evidence 702.

I. **INTRODUCTION**

Plaintiffs Tronox and the United States claim that Tronox’s contingent environmental liabilities at 372 sites totaled somewhere between \$1.5 billion and \$1.7 billion at the time of its IPO on November 28, 2005. In support of their claim, Plaintiffs plan to introduce the testimony of one engineer, Dr. Neil M. Ram of Roux Associates, whom they hired in 2009 to estimate Tronox’s environmental liabilities as of November 2005. But under Federal Rule of Evidence 702, Dr. Ram’s testimony about the 372 sites is inadmissible because it is not the product of principles and methods “reliably applied ... to the facts of the case.” Fed. R. Evid. 702.

What makes estimating the past value of assets or liabilities different from (and harder than) estimating their present value is a single, necessary constraint on the analysis. The value of something as of a date in the past must take into account only facts or data known or knowable on that date. An expert whose estimate relies upon facts or data from after the valuation date does not estimate value *as of that date* but instead estimates value *as of some time after*.

Dr. Ram did not reliably apply that principle of retrospective valuation. At the same time he was valuing Tronox’s environmental liabilities *as of November 2005* for this case, he also was researching and forming opinions about Tronox’s environmental liabilities *from 2006 through 2009* for a different project. Despite the conflict between the two, Dr. Ram directed his

associates to consider information about Tronox's environmental liabilities *regardless of its vintage* and even instructed them to use post-IPO information for both projects. Making matters worse, the valuation methodology Dr. Ram selected (the Most Likely Value method) is particularly susceptible to the distorting effects of hindsight because it depends principally on subjective judgment calls about which single outcome was most likely on the valuation date. Although Dr. Ram claims he told his team to cite only documents with pre-IPO dates for his expert report, they ultimately cited hundreds of post-IPO documents—proof that, at best, no one was paying attention to whether information was actually known or knowable in November 2005.

Other facts underscore the unreliability of Dr. Ram's testimony. He misapplied the Most Likely Value method (which is based on the assumption that one outcome will happen just because its probability is greater than the probabilities of other outcomes) and did not cogently explain why he selected it over the preferred Expected Value method (which reflects a range of possible outcomes, weighted by the probabilities each will happen). At his deposition, he could not explain concepts fundamental to his opinion. And he committed errors that someone familiar with net present value discounting would not have committed.

For these reasons, the Court should hold that Dr. Ram's opinions about Tronox's contingent environmental liabilities cannot be introduced at trial.

II.

LEGAL BACKGROUND

A. Rule 702 Bars Testimony Of Experts Who Do Not Apply Principles And Methods Reliably.

Under Federal Rule of Evidence 702, an expert's opinion is admissible only if it is the product of reliable principles and methods reliably applied to the facts of the case. *See* Fed. R. Evid. 702; *see also* *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993); *Kumho Tire Co.*

v. Carmichael, 526 U.S. 137 (1999). The testimony's proponent must establish its admissibility. *See United States v. Williams*, 506 F.3d 151, 160 (2d Cir. 2007). In administering the rule, a trial court must "make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Kumho Tire*, 526 U.S. at 152. This requires "more than simply 'taking the expert's word for it.'" Fed. R. Evid. 702 Advisory Committee's Note (2000) (quoting *Daubert v. Merrell Dow Pharms., Inc.*, 43 F.3d 1311, 1319 (9th Cir. 1995)) (hereinafter "Rule 702 Advisory Committee Note"). The court must perform "a rigorous examination of ... how the expert applies the facts and methods to the case at hand." *Amorgianos v. Nat'l R.R. Passenger Corp.*, 303 F.3d 256, 267 (2d Cir. 2002).

Rule 702 is not meant to substitute for adversarial methods of testing truth. *See Daubert*, 509 U.S. at 596. Thus, when examining testimony for compliance with Rule 702, the court should distinguish between major and minor flaws in the expert's application of principles and methods. While minor flaws undermine an expert's credibility, major flaws undermine his reliability. *See Amorgianos* 303 F.3d at 267. The difference turns on the nature of the flaw and how close it is to the heart of the expert's opinion. A flaw is not minor just because it happens at one step in a multistep analysis, for "any step that renders the analysis unreliable under the *Daubert* factors renders the expert's testimony inadmissible." *Celebrity Cruises, Inc. v. Essef Corp.*, 434 F. Supp.2d 169, 176 (S.D.N.Y. 2006) (internal quotation marks omitted).

There is no doubt that Rule 702 applies in a bench trial. *See Metavante Corp. v. Emigrant Sav. Bk.*, 619 F.3d 748, 760 (7th Cir. 2010) (citing cases). Some courts have stated that a judge in a bench trial need not rule on Rule 702 objections before trial because there is no jury that might be influenced by unreliable testimony. *See, e.g., Joseph S. v. Hogan*, 2011 WL

2848330, at *2–*3 (E.D.N.Y.). Yet, while pretrial resolution of Rule 702 objections may be “generally less efficient than simply hearing the evidence” in a bench trial, *Victoria’s Secret Stores Brand Mgmt. v. Sexy Hair Concepts, LLC*, 2009 WL 959775, at *6 n. 3 (S.D.N.Y.) (emphasis added), it will be more efficient in some cases. This is one of those cases. The upcoming trial will be complex and will require substantial time and resources. Excluding Dr. Ram’s testimony would greatly simplify the trial and avoid a significant waste of time.

B. Hindsight Cannot Be Used To Determine Value As Of A Past Date.

The date as of which assets or liabilities are being valued “is critically important because circumstances can cause values to vary materially from one date to another, and the valuation date directly influences data available for the valuation.” Pratt, *Valuing A Business*, p. 39 (5th ed. 2008) (hereinafter “Pratt”). When the valuation date is in the past, the determination of value must not be influenced by information from after that date, no matter how enlightening it may be. The Supreme Court has explained why:

The first impression is that it is absurd to resort to statistical probabilities when you know the fact. But this is due to inaccurate thinking. ... [T]he value of property at a given time depends upon the relative intensity of the social desire for it at that time, expressed in the money that it would bring in the market. Like all values, as the word is used by the law, it depends largely on more or less certain prophecies of the future; and the value is no less real at that time if later the prophecy turns out false than when it comes out true. Tempting as it is to correct uncertain probabilities by the now certain fact, we are of opinion that it cannot be done.

Ithaca Trust Co. v. United States, 279 U.S. 151, 155 (1929) (Holmes, J.) (citations omitted).

“[T]he exercise of judgment in hindsight,” in other words, “conflict[s] with basic economics.” *In re Hannover Corp.*, 310 F.3d 796, 802 (5th Cir. 2002).

In a fraudulent transfer case like this one, then, assets and liabilities must be valued based upon “information known or knowable as of the date of the challenged transfer.” *In re Heritage*

Org., LLC, 375 B.R. 230, 284 (Bankr. N.D. Tex. 2007); *In re Commer. Fin. Servs.*, 350 B.R. 520, 541 (Bankr. N.D. Okla. 2005). All other information is impermissible hindsight. A fact about the state of the world on the valuation date is not knowable on that date just because, in theory, it could have been discovered if someone had looked. For example, “[t]he discovery of oil” under a parcel of property “is the kind of ‘subsequent event’ that the rule [against hindsight] makes inadmissible, for it is beyond the contemplation of the parties on the relevant valuation date” even though the oil *must* have been there at all relevant times. *First Nat’l Bk. of Kenosha v. United States*, 763 F.2d 891, 894 (7th Cir. 1985).

In maintaining the “delicate balance” between “consider[ing] only evidence in foresight, and not hindsight,” courts typically bar all information from after the valuation date, but occasionally make an exception for information from “some short time period” after if it tends to show what people knew or anticipated on the valuation date. *Boyce v. Soundview Tech. Group, Inc.*, 464 F.3d 376, 389 (2d Cir. 2006); *see First Nat’l Bk. of Kenosha*, 763 F.2d at 894 (“[C]ourts have not been reluctant to admit evidence of actual sales prices received for property after [the valuation date], so long as the sale occurred within a reasonable time after [that date] and no intervening events drastically changed the value of the property.”). Information from long after the valuation date, by contrast, is irrelevant hindsight because it does not tend to show what contemporaneous buyers and sellers knew or anticipated on the valuation date, that is, how they would have valued an asset or liability as of that date. *See id.* (“The rule against admission of subsequent events is, simply stated, a rule of relevance. ... Under this traditional definition of relevance, evidence of most subsequent events would be excluded.”).

III. **ARGUMENT**

A. Dr. Ram Did Not Reliably Avoid Considering And Using Hindsight In Valuing Tronox's Contingent Environmental Remediation Liabilities As Of November 2005.

In 2009, when Dr. Ram and his team of associates began estimating the value of Tronox's contingent environmental liabilities as of November 2005 for this case, they simultaneously were evaluating the reserves Tronox set for environmental liabilities at the end of 2008. *See* Exh. A to Decl. of Thomas R. Lotterman (Ram Deposition Trans. pp. 94, 113–114, 116–117, 124–125, 126–128) (hereinafter “Ram Trans.”). The requirements of those two projects pulled Dr. Ram and his team in opposite directions. Their work on Tronox's reserves required them to gather, consider, and use more than three years worth of post-IPO, site-specific environmental information (from 2006 to 2009), which their expert work for this case required them to ignore. *See* Ram Trans. pp. 134–135 (admitting that considering post-IPO information was “a matter of necessity” for the reserves project); Ram Trans. pp. 147–149 (admitting that Dr. Ram and his team considered Tronox's post-IPO monthly and cumulative expenditures for all sites listed on Schedule 2.5(a) to the November 28, 2005 Master Separation Agreement); Ram Trans. p. 162 (explaining that he gathered and reviewed information through at least April 2009). Indeed, the documents that Dr. Ram and his team identified as “key” for determining post-IPO reserves at several sites were from after November 2005. *See* Ram Trans. pp. 136–143 (discussing Jackson, Henderson, Beaumont, Rome, Savannah, and service stations sites).

Dr. Ram took no precautions to minimize the adverse consequences of his and his team's exposure to post-IPO information. He did not “wall off” anyone's access to post-IPO information. *See* Ram Trans. p. 163. He did not “specifically prohibit” anyone from gathering or reading post-IPO information. *See* Ram Trans. pp. 164–165. In fact, for his expert work in this case, Dr. Ram affirmatively embraced the knowledge of post-IPO information that he and

his associates gained from working on the reserves project. Whenever an associate worked on a site for the reserves project, he tried to have that same associate work on that site for his expert work. *See Ram Trans.* pp. 107–110, 131–143. Dr. Ram implemented this practice (even though it magnified the conflict between the two projects) because he believed that assigning associates to new sites whose post-IPO information they did not know “is not an efficient way to do it.” *Ram Trans.* p. 166. On top of that, Dr. Ram “instructed” his associates to “tell the whole story” for every site written up in his expert report, including telling site-specific events and developments from after November 2005. *Ram Trans.* pp. 163–165.

Dr. Ram’s methodology for valuing Tronox’s contingent environmental liabilities—the Most Likely Value method—compounds the hindsight problem. As Dr. Ram sees it, his methodology depends upon nothing more concrete than his “professional judgment” about what remediation activities were most likely going to be required at a site after November 2005. *See Ram Trans.* pp. 219, 222. Yet, knowing about a discovery or outcome from after the valuation date can lead a person to conclude that it was always the *most likely*, even if it was just *possible* on the valuation date. *See Ultramares Corp. v. Touche*, 174 N.E. 441, 444 (N.Y. 1931) (Cardozo, J.) (“No doubt the wisdom that is born after the event will engender suspicion and distrust.”). Because Dr. Ram formed his subjective judgments about the most likely remediation outcomes after extensive study and knowledge of post-IPO events, Plaintiffs have a heavy burden under Rule 702 to prove that he reliably avoided the influence of hindsight in forming his judgments.

Plaintiffs cannot carry their heavy burden under Rule 702. Dr. Ram was aware of the potential problems of his approach to post-IPO information. *See Ram Trans.* p. 167 (“Yes, in the back of their minds, maybe they know there is a future cost basis ...”). His only attempt to

compensate for his team's exposure to post-IPO information was to tell them, while preparing the expert report, to imagine "you are now in a time machine and you are going back to November 30 of 2005 and you should only use documents that are available once you arrive at that date in your time machine." Ram Trans. pp. 162–163; *see* Ram Trans. p. 167 ("[T]he number they have to actually put in the cost estimates and cite has to be a known or knowable document as of '05."); *see also* Ram Trans. pp. 36–40, 44–45 (explaining Dr. Ram's decision to cite only one document for each fact even if he read it in multiple documents).

Dr. Ram's team did not follow his "time machine" instruction. They cited post-IPO documents hundreds of times in the expert report. *See* Decl. of Thomas R. Lotterman ¶ 4. Dr. Ram disputes the total number of breaches, but nonetheless acknowledges that documents "slipped through." Ram Trans. pp. 165, 175; *see* Ram Trans. pp. 271–272 (admitting that he used a "25 percent contingency" for one site because it was "supported by costs that were incurred after November 2005"); Ram Trans. pp. 296–301 (admitting that, for his so-called "metric" sites, he used post-IPO information from source sites to generate costs, which he then applied to project costs for target sites). It is immaterial that Dr. Ram may have been able to find pre-IPO documents relating the same facts he read and relied upon in post-IPO documents. *See* Ram Trans. pp. 175–176 ("[I]t turns out that there was -- there was pre-IPO documents with the same information in it."). Under the circumstances, merely citing earlier documents does not show that later documents had no effect on Dr. Ram's judgment about which facts to credit in the first place. Because Dr. Ram's valuation methodology is unusually subjective, the Court cannot disentangle the good from the bad. There is, at bottom, no way for Plaintiffs to prove that Dr. Ram's time machines worked reliably and that he did not use hindsight impermissibly.

Plaintiffs cannot claim that Dr. Ram's approach to gathering and considering the information used in his expert report was somehow in accordance with the fundamental principle of retrospective valuation. He stated that he adopted the approach for expediency, not because it helped him home in on information that was known or knowable on the date of the IPO. *See* Ram Trans. p. 166. And he could not articulate a consistent understanding of the known/knowable standard, thereby confirming that he paid little attention to the difference between knowable and unknowable information while working on his report. He first stated that knowable information is "any information that could have been determined as of November 30 if someone bothered to look," Ram Trans. p. 82, which is too broad. *See* Part II.B, *supra*. When asked follow-up questions about whether certain types of information would have been knowable or unknowable on the IPO date, Dr. Ram drew arbitrary distinctions. *See* Ram Trans. pp. 82–88 (distinguishing knowability of contents of canisters depending on how far underground they are buried and distinguishing knowability of results of soil borings depending on whether they were drawn from the center of the property or the perimeter), pp. 289–291 (contending that information is not knowable if it can be discovered with only a \$100,000 piece of equipment, *i.e.* equipment not readily available).

Dr. Ram's inattention to this critical component of the analysis likely stems from his inexperience with retrospective valuations. Before this case, he never had to limit himself and his team to use only information known or knowable on a past date. During his one prior experience valuing environmental liabilities, he valued them *prospectively* and thus could use information *regardless of its date*. *See* Ram Trans. pp. 25, 29 (explaining that his work valuing liabilities for Sealed Air/W.R. Grace as of 2002 was performed in 2002); *see also* Ram Trans. pp. 153–154 (stating that his work for Sealed Air consisted of estimating future costs). Dr.

Ram's deposition testimony is not clear whether that project entailed only known information or also included knowable information. *Compare* Ram Trans. pp. 81–82 (stating that he had to consider only “known” information for Sealed Air) *with* Ram Trans. p. 154 (regarding his written description of his work for Sealed Air: “It just says ‘known.’ It doesn’t use the phrase ‘knowable’ but I believe -- as best I recall I applied a knowable concept as well there.”). But it makes no difference. He was estimating value as of 2002 in 2002, and no information was (or could be) impermissible hindsight; therefore, there was no need for Dr. Ram to set up the project to avoid exposure to and use of hindsight.

In short, Dr. Ram's opinion in this case is unreliable because he did not reliably apply the fundamental principle of retrospective valuation. He set up this project in the most unreliable way. He used associates intimately familiar with post-IPO results, information, and documents (because they had gathered and studied them for Tronox's 2009 reserves project); he allowed them to consider site-specific information regardless of its date (which was necessary to do the reserves project correctly); and he merely directed them not to cite documents that did not exist before the IPO. That direction failed. His testimony should be excluded as unreliable. *See In re Med Diversified, Inc.*, 334 B.R. 89, 98 (Bankr. E.D.N.Y. 2005) (excluding valuation expert “because he showed a discernible measure of negligence in purportedly applying the alleged professional standards and techniques”). Dr. Ram's assertions that his judgments were not affected by post-IPO information are not good enough to establish the reliability of his methodology for Rule 702. Rule 702 requires “more than simply ‘taking the expert’s word for it.’” Rule 702 Advisory Committee Note; *see In re Med Diversified*, 334 B.R. at 102 (excluding valuation expert who loaded his opinion “with multiple *ipse dixits*”). Because it appears that hindsight in fact influenced Dr. Ram and because Plaintiffs have no way to prove that he did not

use hindsight, the Court cannot conclude that he reliably applied the appropriate principles and methods to this case. *See Lippe v. Bairnco Corp.*, 288 B.R. 678, 689 (S.D.N.Y. 2003), *aff'd* 99 Fed. Appx. 274 (2d Cir. 2004) (excluding valuation expert whose “opinions are based largely on his experience” but who made “no effort to explain how his conclusions were reached, why the conclusions have a factual basis, or how his experience is reliably applied”).

B. Dr. Ram Selected An Inferior Valuation Methodology Without Sufficient Reason And Misapplied It.

The gold standard for estimating environmental liabilities is the probabilistic Expected Value method, which weights a range of outcomes by the probability each will happen.¹ *See generally* Exh. B to Decl. of Thomas R. Lotterman (hereinafter “ASTM E2137-01”). ASTM E2137-01 establishes a hierarchy of valuation methodologies, ranking Expected Value highest in terms of “Robustness/Comprehensiveness.” *See* ASTM E2137-01, Figure 1. ASTM’s recommendation is widely followed; for instance, all experts in what is likely the largest environmental bankruptcy case before this one (*In re Asarco LLC*, Case No. 05-21207, Bankr. S.D. Tex.) used the Expected Value method. *See* Exh. C to Decl. of Thomas R. Lotterman (Expert Report of Neil S. Shifrin and Richard Lane White, Overview Report p. 25, n.16). Courts routinely accept probabilistic methodologies like Expected Value as the best way to determine value. *See Ithaca Trust Co.*, 279 U.S. at 155; *Kimball Laundry Co. v. United States*, 338 U.S. 1, 10 (1949) (“As fixed by the market, value is no more than a summary expression of forecasts that the needs and attitudes which made up demand in the past will have their counterparts in the future.”); *see also Indus. Hard Chrome, Ltd. v. Hetran, Inc.*, 2001 WL 128156, at *2 & n.1 (N.D. Ill. 2001) (bifurcating fraudulent transfer claims because trial “might become increasingly

¹ If there is a 25% chance of paying \$100, a 35% chance of paying \$200, and a 40% chance of paying \$300, the Expected Value is $(.25 \times \$100) + (.35 \times \$200) + (.40 \times \$300)$, or \$215.

complex, as the ‘expected value’ of the exposure becomes the sum of the varying levels of loss multiplied by their attendant probabilities”); *cf. In re Windsor Plumbing Supply Co., Inc.*, 170 B.R. 503, 521 (Bankr. E.D.N.Y. 1994) (“The use of probabilities in estimating claims, rather than the more simplistic all-or-nothing approach, has been used by several courts.”).

Dr. Ram did not calculate Expected Values. He calculated Most Likely Values, which “capture[] the cost of the scenario[s] believed to be most likely to occur.” ASTM E2137-01 § 5.4.2.² The difference between the two is like the difference between the weighted average (Expected Value) and the mode (Most Likely Value) in statistics. An average reflects the range of possible outcomes; the mode ignores all but the most likely outcome. *See* Federal Judicial Center, *Reference Manual on Scientific Evidence* 113 (2000) (hereinafter “*Reference Manual*”); Kirk, *Statistics: An Introduction* 74, 77–78 (5th ed. 2007). While the mode sometimes can prevent a prediction from being skewed by an outlier (*i.e.* an extreme outcome with a small chance of happening), in many cases, the mode skews the prediction by making one outcome seem too certain (*e.g.*, when the most likely outcome is not all that likely or when there are multiple modes). *See* Glenberg, *Learning From Data: An Introduction To Statistical Reasoning* 54 (3d ed. 2007) (“The greatest disadvantage is that the mode ignores much information (magnitude, equal intervals, and scores near the ends of the distribution).”). As a result, “the mode is rarely used by statisticians.” *Reference Manual* 113 n.100.

The mode’s limited utility in statistical applications does not translate to determining value. Rational actors in the market who care about costs tend to account for all future eventualities—even outliers. *See Reference Manual* 114 (explaining how “the mean is the more

² Using the example from the prior footnote, the Most Likely Value is \$300, as no single scenario is more likely.

appropriate statistic” for companies that have to pay for the costs of outliers). This is why the probability-weighted average is superior and widely preferred for determining value.

Dr. Ram’s explanation for why he selected the Most Likely Value method over the Expected Value method is internally inconsistent. He claims he selected the Most Likely Value method because he lacked enough data to assign probabilities to potential environmental remediation outcomes at the sites. *See* Ram Trans. pp. 220–222. But if the data were so poor that he could not assign probabilities to outcomes, he also could not rationally determine which single outcome is most likely and thereby disregard all other outcomes.

Dr. Ram further claims that, by ranking outcomes ordinally from most to least likely and by not considering their respective probabilities, his application of the Most Likely Value method was consistent with ASTM guidance. *See* Ram Trans. p. 221 (“I don’t believe ASTM defines a percentage” for when an outcome is most likely); p. 222 (“[I]f ASTM thought there should be a threshold for MLV, I am sure they would -- I expect they would have put it in there, but they don’t; it is professional judgment.”). In fact, in explaining how and when to apply the Most Likely Value method, ASTM recommends that an evaluator consider the probabilities of different outcomes—not just their relative ranking—and consider whether the most likely outcome has a sufficiently high probability of occurring:

The MLV may represent a grouping or cluster of scenarios where the cost outcomes are close in magnitude and the combined probability of the grouping or cluster exceeds the probability of other possible scenarios. The MLV is not useful if no scenario, grouping or cluster of outcomes has a probability of occurrence that is significantly greater than others.

ASTM E2137-01 § 5.4.2. In other words, ASTM’s explanation of and justification for the Most Likely Value method tracks the basic statistical explanation of and justification for relying upon

the mode: it is useful when the value of “significantly” low probability outcomes might obscure the value of “significantly” high probability outcomes.

Dr. Ram’s failure to apply the Expected Value method, his failure consistently to explain why he chose the Most Likely Value method, plus his failure to apply the latter in accordance with the guidance documents he cited, taken together, demonstrate that he did not reliably apply accepted methodologies for valuing contingent environmental liabilities. His testimony should be excluded. *See Lippe*, 288 B.R. at 689–694 (excluding valuation expert whose testimony was “based largely on his experience” and who failed to use “the most reliable method for determining the value of a business”); *see also In re Med Diversified, Inc.*, 334 B.R. at 98–102 (excluding valuation expert for not considering the widely accepted valuation methodology).

C. Dr. Ram Does Not Understand The Discounting Principles He Supposedly Applied.

After selecting what he believed to be the most likely remediation scenario for each site after November 2005, Dr. Ram estimated the future cash flows each scenario would demand. Then, by attempting to discount those future cash flows to present value and adding them up, he purportedly arrived at a net present value for Tronox’s most likely environmental remediation liabilities at each site. *See Ram Trans.* p. 316 (“I populated the cost elements into the years in which they could reasonably be anticipated to occur based upon the cost elements and then those were discounted back to 2005 as net present value.”). Dr. Ram claims that he oversaw this work “100 percent” and that no one outside Roux Associates helped prepare the cash flows. *See Ram Trans.* pp. 70–71.

During his deposition, it became clear that Dr. Ram does not understand elementary discounting concepts that he needed for his discounting to be reliable. His unfamiliarity with the very concepts he supposedly applied renders his opinion unreliable and inadmissible. *See Lippe*,

288 B.R. at 689–694 (excluding valuation expert who was unfamiliar with established valuation principles and methods, failed to consider important variables, and committed several errors).

First, Dr. Ram could not explain net present value discounting. At the start of his deposition, when discussing his prior work for Sealed Air, Dr. Ram stated that he had not determined net present value for that project. *See* Ram Trans. p. 27; *see also* Ram Trans. p. 29 (“I didn’t have to project what years those costs would be incurred and then do a net present value back to 2002 as I did in this matter.”). When explaining what he meant, Dr. Ram equated the task of discounting future values to present value with having to apportion liability among multiple parties, mixing up two independent concepts. *See* Ram Trans. pp. 28–29 (“Q: And when you said there was no net present value, what did you mean by that? A: Just, I don’t believe in that Grace matter there was any apportionment issues.”). Later, when asked whether he was “familiar with the term ‘net present value,’” Dr. Ram deflected with a non sequitur. *See* Ram Trans. p. 326 (“I don’t -- If there is a distinction between present value and net present value I don’t know the subtleties.”). And when asked to explain the “distinction between net present value and a discounted rate,” Dr. Ram conceded, “I am not familiar with the subtle difference between those two terms either.” Ram Trans. p. 326. Those are not subtly different concepts: the discount rate is the critical variable in the net present value calculation. *See* Pratt, p. 175 (“[T]he basic concept of the income approach is to project future economic income ... and to discount this projected economic income stream to a present value at a discount rate appropriate for the expected risk of the prospective income stream.”); *see also United Air Lines, Inc. v. Regional Airports Improvement Corp.*, 564 F.3d 873, 879 (7th Cir. 2009) (“In a discounted-cash-flow analysis, the discount rate has a powerful effect on the present value.”).

Second, Dr. Ram could not articulate the difference between a real discount rate and a nominal discount rate. *See* Ram Trans. pp. 325–326. And he did not know whether the discount rate that he used in his analysis was real or nominal. *See id.* “The real interest rate is generally defined as the nominal rate less inflation. ... It follows that the nominal rate must be equal to the real rate plus inflation.” *Winston ex rel. Winston v. United States*, 11 F. Supp.2d 948, 949 (W.D. Ky. 1998). Whether one uses a real or nominal rate to discount future cash flows depends on whether the future cash flows include inflation. A mismatch can seriously overstate or understate the net present value. It is a simple distinction, and Dr. Ram’s failure to understand it further undermines the reliability of his analysis.

Finally, Dr. Ram committed at least two errors that someone familiar with discounting would not have committed. One error is in his calculation of net present value. He discounted future cash flows back to January 1, 2006, rather than November 28, 2005, the date of the IPO. *See* Ram Trans. pp. 69–70. The month difference may seem minimal, *see id.*, yet Dr. Ram could have avoided the inaccuracy entirely if he had a better grasp of discounting. The other error is in Dr. Ram’s use of metrics—his use of information from a set of source sites to project costs at a set of target sites (*e.g.*, wood treater sites). *See* Exh. C to Decl. of Thomas R. Lotterman (Expert Report of Neil S. Shifrin and Richard Lane White, Overview Report p. 27, § 3.2.4). In brief, Dr. Ram calculated past and future cash flows for the source sites, discounted the future cash flows, added the past cash flows, then transferred that net present value figure to target sites. That simple transfer makes no sense. Unlike the source sites, the target sites have no past costs. Their costs are all future costs, so all their cash flows must be discounted. The net present value figure Dr. Ram derived from the source sites and applied to the target sites, however, includes undiscounted past costs. Dr. Ram should have taken the source sites’ past and future cash flows

and made them all future cash flows for the target sites, at which point he could have discounted them all. In essence, Dr. Ram did not discount enough for the target sites and ended up with estimates for target sites that are too high. This error, like the other, shows that Dr. Ram does not truly understand discounting or what net present value represents.

IV. **CONCLUSION**

Under Rule 702, the Court should exclude Dr. Ram's testimony about Tronox's contingent environmental liabilities.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on March 16, 2012, a true and correct copy of the foregoing was served on the following counsel of record by ECF and/or as indicated below:

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